

# A Novel Technology for Simultaneous TOC Reduction and Biofouling Prevention, Phase I

Completed Technology Project (2006 - 2006)



## Project Introduction

Long-duration space missions such as the upcoming Moon and Mars missions require reliable systems for the preparation of potable water through efficient recycling, and prevention of biofilm growth on reverse osmosis (RO) membranes and water lines. Lynntech, Inc. proposes a novel technology to simultaneously reduce the total organic carbon (TOC) content of biological water processor (BWP) processed water, and control biofilm formation on water lines, surfaces and membranes within the water reclamation unit utilized on board spacecraft and within future planetary habitats. This technology is based on Lynntech's proprietary electrochemical on demand oxidizer generator, which does not require consumable chemicals. The on-demand produced oxidizer can be added to the primary processed water from the BWP unit. Using this innovative approach in the form of a compact TOC and microbial count (MC) reduction module which will be situated in line with the BWP unit, Lynntech aims to achieve an order of magnitude reduction in the TOC content within the BWP processed water. The residual oxidizer/disinfectant and reduced TOC will prevent the formation of biofilms on the RO membrane and water lines and will reduce the equivalent system mass by lowering the load on equipment downstream to the BWP, enabling a reduction in their size and weight. Phase I work will concentrate on providing proof-of-concept for the technology while Phase II will involve the fabrication of a prototype TOC and MC reduction module and its integration with the Integrated Advanced Water Recovery Test System operational at NASA-JSC.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Johnson Space Center (JSC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Lynntech, Inc.	Supporting Organization	Industry	College Station, Texas

## Primary U.S. Work Locations

Texas

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX06 Human Health, Life Support, and Habitation Systems
  - └ TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
  - └ TX06.1.2 Water Recovery and Management